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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,070	05/11/2006	Hoon Han	36470-231114	3303

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EXAMINER	
SAJJADI, FEREYDOUN GHOTB	
ART UNIT	PAPER NUMBER
1633	
MAIL DATE	DELIVERY MODE
10/30/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/579,070	HAN ET AL.	
	Examiner	Art Unit	
	FEREYDOUN G. SAJJADI	1633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/14/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Status

Applicants' response of July 14, 2008, to the non-final action dated April 14, 2008, has been entered. Claims 1-3 are pending in the application. No claims have been amended, cancelled or newly added.

Claims 1-3 are under current examination.

Information Disclosure Statement

The information disclosure statement dated 7/14/2008 has been considered and indicated as such on Form PTO-SB/08A.

Response to Claim Rejections - 35 USC § 103

Claims 1-3 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Erices et al. (Br. J. Hematol. 109:235-242; 2000), in view of Nishikawa et al. (U.S. Patent Application Publication No.: 2004/0235160; effective filing date: Aug. 7, 2002), and further in view of Petaja et al. (J. Clin. Invest. 99:2655-2663; 1997). The rejection set forth on pp. 2-4 of the previous office action dated April 14, 2008 is maintained for reasons of record.

Applicants traverse the rejection, arguing that the analysis in the U.S. PTO rejection does not appear to establish the differences between the subject matter claimed and the information in the applied references; because Erices et al. relates to mesenchymal progenitor cells in human umbilical cord blood, whereas a characteristic feature of the rejected claims is that mesenchymal stem cells are isolated from umbilical cord blood. Further arguing that in the instant claims the umbilical cord blood is dilute in α-MEM, followed by centrifugation so as to harvest monocytes, whereas in Erices et al., cord blood is diluted with M-199 and the diluted cord blood cells are separated into a low-density fraction to obtain mononuclear cells, which are then suspended into culture medium comprising α-MEM, fetal bovine serum and gentamycin sulfate. Concluding

that the method used by Erices et al. is different from the subject invention with respect to the dilution medium and with respect to the components of culture medium. Applicants' arguments have been fully considered, but are not found persuasive.

As an initial matter, it should be noted that the terms mesenchymal progenitor and mesenchymal stem are used interchangeably in the hematopoietic mesenchymal stem cell art. With respect to the use of dilution medium prior to centrifugation of the umbilical cord blood, the previous office action noted the medium for dilution of the cells prior to centrifugation may be M-199 or α-MEM, both disclosed by Erices et al.; that a person of ordinary skill in the art would regard as functional equivalents for the purposes of dilution. Moreover, Applicants have not provided any evidence why dilution in α-MEM would constitute a critical method step, as both M-199 or α-MEM media disclosed by Erices et al. would be considered functional equivalents by a person of ordinary skill, for the purpose of dilution prior to centrifugation over Ficoll-Hypaque to harvest monocytes.

With respect to the suspension culture medium following the harvest of monocytes, instant claim 1 states that the monocytes are placed into suspension culture in α-MEM medium containing glutamine, fetal bovine serum, an antibiotic, an anti-fungal agent, stem cell factor (SCF), granulocyte macrophage colony stimulating factor (GM-CSF), granulocyte colony stimulating factor (G-CSF), interleukin-3 (IL-3) and interleukin-6 (IL-6). Thus, the containing language employed by the claim is open and does not exclude the presence of additional factors. Moreover, Applicants have argued against the references individually, and one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The limitations regarding additional culture additives and cytokines are provided by the secondary reference of Nishikawa et al.

With reference to a published communication in Haematologica, Applicants argue that the authors of the communication indicated that they were unable to isolate MSCs from UCB, and that their findings did not agree with the findings of Erices et al. Such is not found persuasive, because the authors of the Haematologica communications further qualify their

foregoing statements, by indicating that Erices et al. recently identified mesenchymal progenitor cells in 25% of their UCB harvests, and however, that their results were obtained using a pool of different units of pre-term UCB, and probably, in such as a way as to enhance the rather low population of MSCs in pre-term UCB. Thus, highlighting differences between their methodology and that employed by Erices et al.

Applicants next argue that the article of Romanov et al. suggest that umbilical cord blood rarely contains mesenchymal stem cells. Such is not found persuasive, because the authors state that cord vasculature contains a high number of MSC-like cells with mesenchymal cell markers (Abstract). With regard to Applicants' reference to the publication of Wexler et al. stating: "Adult bone marrow is a rich source of human mesenchymal 'stem' cells but umbilical cord and mobilized adult blood are not.", it should be noted that Wexler et al. actually isolated MSC-like cells from cord blood (Abstract), and the fact that there are more MSCs in bone marrow than in cord blood is irrelevant to the instantly claimed method. Applicants' statement that "there is no evidence here that, prior to the work of applicants, any one has tried to obtain mesenchymal stem cells from umbilical cord blood", is clearly false in view of the Haematologica communication, dated 2001.

Applicants further argue that the secondary references of Nishikawa et al. and Petaja et al. do not make up for the deficiencies of Erices et al. Such is not found persuasive, because the Nishikawa et al. reference was presented to cure the deficiency of mesenchymal cell culture supplements, and Petaja et al. for its teaching of low concentration heparin. In sum, Applicants have failed to disqualify the Erices et al. reference and its teachings.

With respect to the language of claim 1 pertaining to the volume of cord blood and anti-coagulant, Applicants state that the language is not with reference to anti-coagulant units, but rather cord blood unit (CBU). However, such an interpretation would not make sense. For example, if a CBU unit is designated as 120 ml, then the claim would read as umbilical cord blood having a volume of more than 45 ml per 120 ml of umbilical cord blood. A unit generally has a fixed defined value. Moreover, as more than 45 ml has no upper limit, such interpretation would be indefinite. The previous office action, noted that the reference to the concentration of anti-coagulant as more than 45 ml per unit is unconventional, given that the art-recognized

nomenclature for anti-coagulants such as heparin is units per ml. The instantly claimed concentration, when given its most reasonable interpretation would be equivalent to less than 0.02U/ml. Applicants should have therefore amended claim 1 to clearly set forth language that distinguishes the recited volume as separate from the anti-coagulant final concentration, and set forth a defined unit in accordance with the teachings of the specification. In addition, if the teachings of Petaja et al. are not required, the rejection is still valid in view of the disclosures of Erices et al. and Nishikawa et al.

Finally, the allowance of the claims in a counterpart Korean Patent Application has no bearing on the instant Application, as the instant claims have been examined under U.S. patent law, and in accordance with the teachings of the MPEP.

Thus, the rejection is maintained for reasons of record and the foregoing discussion.

Conclusion

Claims 1-3 are not allowed.

THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR§1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FEREYDOUN G. SAJJADI whose telephone number is (571)272-3311. The examiner can normally be reached on 6:30 AM-3:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Woitach can be reached on (571) 272-0739. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Fereydoun G Sajjadi/
Fereydoun G. Sajjadi, Ph.D.
Examiner, Art Unit 1633